ERASMUS UNIVERSITY ROTTERDAM

Erasmus School of Economics

International Bachelor Economics and Business Economics

BACHELOR THESIS

What Influences Innovative Entrepreneurship?

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Word count: 7780

Date: 31.07.2019

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Introduction

Entrepreneurship is one of the highly discussed topics in academic literature (Baumol, 1996). One of the controversial aspects related to entrepreneurship are the causes and reasons that make people take a risk of starting the own business instead of taking the more risk-averse route of working for a company. One of the possible important factors that influence entrepreneurial entry is national culture (Hayton, George and Zahra, 2002). Although some findings of academic papers do not confirm this relationship (Steensma, Marino, and Weaver 2000), a lot of papers show the effect of national culture and informal institutions on entrepreneurship (Hayton, George, and Zahra, 2002; Thornton, 1999). There are multiple effects of culture on entrepreneurship: for example, Makino and Neupert (2000) claim that cultural differences (individualism level, to be precise), affects the preferred market entry mode, Steeensma, Marino and Weaver (2000) claim that culture affects whether market entrants are more likely to choose cooperative or competitive strategies, Geletkanycz (1997) claims that culture affects whether entrepreneurs and executives would aspire for preserving status quo or for breaking said status quo. To sum it up, the effects of culture on entrepreneurship are strong and diverse.

However, less attention is devoted to the topic of innovative entrepreneurship. According to Baumol, innovative entrepreneurs "locate new ideas and put them into practice" (Baumol, 2010). Global Entrepreneurship Monitor defines innovative entrepreneurships as "entrepreneurship that creates a new product or service for the market and that has few competitors" (Global Entrepreneurship Monitor, 2013). Although there are multiple works that try to define the drivers of entrepreneurship entry, there are almost no studies that define the drivers of innovative entrepreneurship. This is a major problem, since innovative entrepreneurship is a key factor of modern economic growth (Szabo and Herman, 2012).

Because there is proven link between cultural differences, such as fear of failure, and entrepreneurial entry (Wennberg, Pathak, Autio, 2013), it can be assumed that there is a link between the innovative entrepreneurship and cultural differences. Beyond that, different economic variables that also have a proven link to entrepreneurial entry are going to be tested on their relationship to innovative entrepreneurial entry, so the research question of this thesis is **"What cultural and economic variables influence innovative entrepreneurial entry?"**.

This paper tries to use the previous literature to find the drivers of innovative entrepreneurship and then evaluate whether the assumed drivers have a statistically significant effect on innovative entrepreneurship. A close look is taken at the cultural variables, since, as mentioned before, they are presumed to be very important drivers of entrepreneurship, so they might influence innovative one as well. Beyond that, different economic variables are taken to evaluate whether their effect is bigger or smaller than the effect of cultural variables.

There are three cultural variables that are assumed in this paper to have an effect on innovative entrepreneurship rates. The first cultural variable is *individualism*, which is commonly referred in academic literature as one of the drivers of innovation (Hofstede, 1980) and entrepreneurial entry (Mitchell et al., 2000). However, there is an ongoing debate whether higher individualism is directly correlated with higher entrepreneurship rates, with some scientists arguing that both collectivist and individualist societies might force an individual to pick up entrepreneurship, although for different reasons (Trulsson, 1997). Nevertheless, due to a sheer volume of academic claims that individualism is tied with innovation and entrepreneurship, this variable was included into the paper.

The second cultural variable that was included is *fear of failure*. Weak uncertainty avoidance (which is essentially the same as low fear of failure) is commonly linked to higher rates of entrepreneurial entry (Welpe et al., 2012). Fear of failure is also presumed to hinder the aspirations of an individual (Burnstein, 1963). It was assumed that fear of failure effects would be catalysed, since innovative entrepreneurial entry is even more risky and uncertain than non-innovative entrepreneurial entry, so this variable was included in the paper.

Last cultural variable that was included was *high status to successful entrepreneurs.* According to Malach-Pines and Levy (2005), higher societal reward to successful entrepreneurs made individuals more like to choose entrepreneurship career path. It was assumed that high societal reward would force more individuals to find new and creative ways to start a business, thus raising the percentage of innovative entrepreneurship in a given country, so this cultural variable was also included in the thesis.

There is also a plethora of economic variables that were included for two reasons. First of all, all of the variables that were included in the thesis have a significant effect on entrepreneurship rates according to the academic literature. Secondly, testing them in mathematical models alongside the cultural variables could lead to potentially important

results and conclusions. The economic variables included were: *Financing for Entrepreneurs*, *Support and Policies*, *Taxes and Bureaucracy*, *Post School Entrepreneurial Education and Training*, *R&D Transfer*, *Commercial and Professional Infrastructure*. More in-depth information on each economic variable can be found in Theoretical Framework section.

The data for this thesis was collected through two sources. First source is Global Entrepreneurship Monitor, which is the largest source of data regarding entrepreneurship and SMEs, which includes variables about motivations and drivers for starting businesses, as well as national economic context in which individuals undertake entrepreneurial activity. The second source was the paper by Minkov et al. (2017), which uses Geert Hofstede's cultural dimensions framework on individualism and performs a survey to get the most updated national data on this topic.

After getting, examining and structuring the data, regression models are built. First regression model concerns only cultural variables. The second regression includes only economic variables. The third model is the expanded model, which includes both economic and cultural variables. The expanded model is the most important model in the whole thesis.

The outline of the thesis is the following: the next section is Theoretical Framework, which will give an elaborate overview on the academic works regarding drivers of entrepreneurial entry, which give the much needed background to form hypotheses for this thesis. After this Data and Methodology section is presented, which addresses the data and the modelling in this thesis. The Results section gives an overview of the output of the mathematical models, and the Discussion section gives an analysis of said output, while also addressing both limitations and added value of the paper.

Theoretical Framework

Firstly, to give the reader an overview of core concepts used in this thesis, the definition and explanation of the term "cultural differences" will be provided, as it is, undeniably, an umbrella term, which needs clearer definition. Secondly, cultural factors that might influence innovative entrepreneurship will be discussed, such as fear of failure rate or

individualism rate. Beyond that, economic factors such as financing for entrepreneurs, GDP and R&D transfer will be discussed. After this several hypotheses will be provided to answer the research question.

It is also important to notice that in this thesis we are going to deal with innovative entrepreneurship, because the influence of cultural difference on it is not yet clear, judging from the existing academic work. We define innovative entrepreneurship similarly to GEM (Global Entrepreneurship Monitor) – innovative entrepreneurship is entrepreneurship activity which service or product is new for the customers AND does not have a significant amount of competitors offering the same product (Global Entrepreneurship Monitor, 2013).

However, the theoretical framework is built on the research about all entrepreneurial activity, not only innovative entrepreneurship. This is done because there are not enough studies covering only innovative entrepreneurship, so we assume the drivers that affect innovation and entrepreneurial entry both affect innovative entrepreneurship by extension. In other words, it is being tested whether the drivers behind entrepreneurial entry and innovative entrepreneurial entry are the same. One of the core assumptions that will be covered later is that the innovative entrepreneurial entry is shaped by the cultural differences first and foremost.

Cultural innovative entrepreneurship drivers

Cultural differences are a very well-known and important part of human existence. Some researchers and organizations, such as UNESCO, argued that preserving cultural diversity of humankind is equally important to preserving biodiversity in nature, as they play a great role in differentiating regional populations from each other and in preserving their heritage and identity (UNESCO, 2001).

At its core, culture, and, consequently, cultural differences can be defined as "collective programming of the mind that distinguishes the members of one group or category of people from others" (Hofstede, 2011). It is also important to mention that culture operates mostly unconsciously, and the collective programming of the individual is influenced by political institutions, but these institutions themselves are also influenced by collective cultural programming (Hofstede, 1980). That collective programming obviously

influences the beliefs and morality of people, but the influence of cultural differences goes far beyond than that. Chryssides and Kaler (1996), Ferrell et al. (1996) and Scholtens and Dam (2007) argue that the way of conduction of business and entrepreneurial activities is, according to Chryssides and Kaler (1996), "a response to religious, philosophical, societal, economical, and institutional concepts and notions". Other papers give a similar explanation. From this we can infer one important thing: cultural differences and business go hand-in-hand.

The empirical evidence is also freely available, as there are many academic and non-academic articles and books on conducting business negotiations in foreign environments, as some cultural notions and concepts can differ significantly from country to country (Ho, 1976). One of the interesting and well-documented examples is the Chinese concept of "face" or "lian". In Chinese culture losing "lian", which is essentially an amount of social expectations placed upon the individual, is a very serious issue that is not taken lightly by Chinese (Ho, 1976). One can lose face by, for example, losing an argument with a crowd present. This makes the business negotiations more difficult for people from other cultures, as for Chinese persons saving face might be more important than being right, which is a foreign concept in other cultures (Cardon and Scott, 2003). The influence of "saving face" on negotiations is just one of the many examples of cultural differences' influence on business.

The main assumption of this thesis is based on the aforementioned fact that conduction and creation of business is a response to societal and institutional concepts. If this is true and the way of conducting a business is influenced by cultural differences of a country, it is fair to assume that the type of businesses created in a country would also be influenced by the cultural factors. I assume that innovative entrepreneurship is different from country to country based on a psychological features that people of this culture have.

Individualism

There is also academic support for the theory that cultural differences impact the business creation in different countries by influencing cognitive distinctions that these cultural differences cause through aforementioned collective programming: Busenitz and Lau (1996) and Mitchell et al. (2000) provide evidence that cognitive differences affect the new venture creation decision. Mitchell et al. (2000) paper finds strong support for individualism

as one of the main drivers for decision to start a new business. To add on that, a lot of previous studies, such as Herbig and Miller (1991), Barnett (1953), Beteille (1977), claim that higher individualism leads to a higher cultural innovative capacity, "the ability of a country to produce and commercialize a flow of innovative technology over the long term" (Furman et al., 2002), whereas higher collectivism leads to a lower capacity.

To elaborate on the point above, individualism and its opposite, collectivism, are considered to be one of the defining characteristics of cultures. This is explicitly described by Hofstede (1980), who says that individualistic societies operate in a loosely-knit social framework, where an individual is responsible only for their immediate family, whereas collectivist societies operate in a tightly-knit framework where individuals are expected to take care of other members of their community.

To be more precise, individualism influences entrepreneurial intention in several ways. First of all, individualistic societies do not limit private property in the same way that collective societies do, thus protecting individual ideas. Moreover, it can be argued that because of the fact that individualistic societies do not severely limit personal wealth cap, individuals are more motivated to participate in risky profit-seeking behaviour, which is entrepreneurship. Beyond that, collective societies might not allow entrepreneurial individuals to "shine", as in collective societies entrepreneurial tasks are distributed among the groups, rather than individuals (Mitchell et al., 2000).There exists another argument that could possibly strengthen the point that individualism might be a strong driver of entrepreneurship, and, by assumption and extension, innovative entrepreneurship. According to Erez and Earley (1993), goals and motivations outlines are provided by a cultural background. In short, cultural differences dictate the differences in goal orientations in different countries, thus it can be assumed that individualistic cultures might be more welcoming to self-realization of a person through entrepreneurial work, as the individual is fulfilling his goal of, so to say, "forging his own destiny".

However, there are academic works that show the possible paradox happening with this line of thought. Even though the logic behind goal orientation differs in cultures, the goals themselves might be the same. As in individualistic societies the entrepreneurial activity might satisfy the drive for autonomy, in collectivist societies the same activity might satiate the drive of improving the local community through creating a new locally useful business (Baum et al., 1993). Another interesting case is shown by Trulsson (1997), who

writes about Tanzanian entrepreneurs, who, having a profit-seeking goal in mind, do things that may be deemed irrational from a business perspective. These entrepreneurs often hire close and distant family members, even though they are often not qualified for the task. In this way the entrepreneurs fulfil their obligation to their community – create enough workplaces to bring in more money for their household, even though it directly eats into their profits. This example showcases us an important paradox – different cultures might justify the creation of businesses in a different way, but the end goal is still the same.

Moving onto hypothesis formulation, individualism is proven to be an important driver for entrepreneurial intentions (Linan et al., 2016), which makes logical an assumption that it is able to influence the rate of innovative entrepreneurship as well.

Thus, H1 in this thesis is:

Hypothesis 1: *"Cultural individualism is a significant driver of innovative entrepreneurship"*.

Fear of Failure

Hofstede (1980) claims that weak uncertainty avoidance leads to a higher cultural innovative capacity. It should be noted that fear of failure and uncertainty avoidance can be essentially equated to each other. Fear of failure is "self-evaluative framework that influences how he or she defines, orients to and experiences failure in achievement situations, especially those related to risk taking-behavior" (Caraway et al., 2003). In other words, fear of failure is the amount of anxiety that a person might experience when presented with an opportunity with uncertain outcome, and the less the discomfort that the individual gets, the less his or her uncertainty avoidance becomes. Thus, we can say that another possible innovative entrepreneurship driver could be fear of failure, which has a significant negative influence on entry (Wennberg, Pathak, Autio, 2013).

There are several papers that outline the importance of fear of failure on motivations and aspirations of an individual. Burnstein (1963) highlights the fact that with fear of failure increasing, individuals tend to make different choices, such as settling for less satisfying/prestigious jobs, and that the aspiration of getting the prestigious occupation decreased. Analysing this in the context of innovative entrepreneurship, it can be said that

with increasing fear of failure less people will undertake prestigious entrepreneurial activity, as confirmed by Burnstein experiment. Similar results were found by Welpe et al. (2012), where it is stated that increased fear of failure makes a person less likely to exploit a business opportunity. Again, by extension of this idea, it is assumed that fear of failure is an important driver for innovative entrepreneurship, since individuals from cultures with higher fear of failure are less likely to exploit innovative opportunities and start a business which has no analogues on the market.

As the next step we establish hypothesis that is related to fear of failure. Fear of failure takes a cornerstone role in decision to become an entrepreneur or to exploit a profit-making opportunity (Welpe et al., 2012). Therefore we expect fear of failure to impact innovative entrepreneurial activity significantly, as fear of failure is related to risk avoidance (Atkinson, 1952), and innovative entrepreneurship is an even deeper dive in uncharted uncertainty territory than non-innovative entrepreneurship, since innovative entrepreneurship by its definition deals with products that are completely new to the markets. Therefore, the second hypothesis:

Hypothesis 2: *"Countries scoring high on "Fear of Failure" rate score low on innovative entrepreneurship rate"*.

High Status to Successful Entrepreneurs

Moving forward, attention will be given not only to cultural goals and aspirations, but to the societal reward of reaching these aspirations as well. This idea is introduced in Malach-Pines and Levy (2005), where the researches found the correlation between higher societal status of successful entrepreneurs and readiness to leave a secure job to join or create a start-up. This is fairly logical, as higher status to successful entrepreneurs raises the non-monetary benefits of the job, such as prestige, which makes it more likely for people to choose it as a career. Vice versa, lower status of entrepreneurship adds non-monetary disincentives, such as societal pressure to choose another career, thus diminishing the amount of people that would choose the entrepreneurial way of working. So high status to successful entrepreneurs is added to a list of potential innovative entrepreneurship drivers.

It is assumed that this might have a significant influence on innovative entrepreneurship because, as mentioned before, entrepreneurial activity is a response to cultural norms, therefore if society highly values successful entrepreneurs, they are more incentivized to enter the market. I expect a positive correlation of high status and innovative entrepreneurship rates for the reasons explained in the previous section, so:

Hypothesis 3: "Cultures that give high status to successful entrepreneurs score higher on innovation scale".

Economic drivers of innovative entrepreneurship

Even though the main assumption of this research paper is that cultural differences have strong influence on innovative entrepreneurship rates, other variables can not be ignored. Beyond cultural differences there are also different economic variables that influence entrepreneurial entry and may influence innovative entrepreneurial entry as well.

One of the most obvious ones are governmental policies employed that are designed to help entrepreneurs. Leitao and Baptista (2009) name several policies that can help the entrepreneurs and probably increase entrepreneurship rates growth, such as promoting equity flows in smaller businesses, subsidies for rural entrepreneurs, faster, less complicated taxation processes, and so on. This echoes one of the GEM variables called *Governmental Support and Policies*, which Global Entrepreneurship Monitor defines as "the extent to which public policies support entrepreneurship" (GEM, 2013). Because there is support for the idea that governmental support helps increase total entrepreneurship rates, it is only fair to assume that innovative entrepreneurship rates are also affected, thus it makes sense to include this variable in the models. Thus, the hypothesis 4 is *"Countries that implement governmental support and policies score higher on innovative entrepreneurship rate".*

Leitao and Baptista (2009) also mentions one driver of entrepreneurial entry, which can be found in GEM, namely *Financing for Entrepreneurs*. GEM defined this variable as *"the availability of financial resources—equity and debt—for small and medium enterprises (SMEs) (including grants and subsidies)"*. In their paper Leitao and Baptista claim that in UK, with the increase in, Venture Capital Trusts (VCTs), and EISs, Enterprise Investment Schemes, the amount of companies receiving investment from them increased severely which

led to significant economic growth in the SME sector. This is an empirical, albeit local, example of how favourable financing for entrepreneurs impact sector's economic growth. Therefore it is interesting to test whether financing helps with innovative entrepreneurship as well, and on a national level in different countries. Thus, the hypothesis 5 is *"Countries that make financial resources more available for entrepreneurs score higher on innovative entrepreneurship rate"*.

Another economic variable found in GEM that could potentially influence innovative entrepreneurship rates is *Taxes and Bureaucracy*, which is defined by GEM as *"the extent to which public policies support entrepreneurship, so that taxes or regulations are either size-neutral or encourage new businesses"*. The support for relevancy of this variable can be found in Djankov et al. (2010), which states that high corporate tax has strong adverse effects on both entrepreneurial activity and corporate investment. The "bureaucracy" part of the variable explanation proves to be relevant by Sorensen (2007). In his paper the relationship between bureaucratic environments and entrepreneurial entry is examined, and it is found out that in more bureaucratic environments individuals are much more hesitant to start entrepreneurial activity. These two papers provide me with enough justification to include this variable in the models. Thus, the hypothesis 6 is *"Countries that implement taxation and regulatory policies that encourage new businesses score higher on innovative entrepreneurship rate"*.

Next potentially interesting variable is *Commercial and Professional Infrastructure*, that is defined by Global Entrepreneurship Monitor as *"the presence of property rights, commercial, accounting and other legal and assessment services and institutions that support or promote SMEs"*. There are plenty of papers that highlight the importance of infrastructure for entrepreneurial activity, but the focus is going to be set on Van De Ven (1993), who claims that entrepreneurship prospects in the country are positively affected by proper infrastructure that is provided by governmental institutions. Beyond that, it seems only logical that infrastructure that aims to support entrepreneurs would positively affect entrepreneurial growth. However, the link with innovative entrepreneurship is not as obvious and not proven at all, so it makes sense to test it in the models. Thus, the hypothesis 7 is *"Countries that have property rights which support SMEs score higher on innovative entrepreneurship rate"*.

Another variable that would make sense to test is *Post School Entrepreneurial Education and Training*. Echtner (1995), Ladzani and Van Vuuren (2002), Sanchez (2011) all show the positive effects of post school entrepreneurial education on entrepreneurial entry, both on local and national levels. However, the effect on innovative entrepreneurial entry is not clear. One may assume that entrepreneurial education might focus on old and fairly outdated case studies, thus not incentivizing innovative entrepreneurship. On the other hand, an argument could be made that entrepreneurial education helps with all kinds of entrepreneurship, innovative or not. Either way, it makes sense to test this variable in a model. Thus, the hypothesis 8 is *"Countries that provide post school entrepreneurial training score higher on innovative entrepreneurship rate"*.

Next economic variable that might be useful to include is *R&D Transfer*, which is defined in GEM as *"the extent to which national research and development will lead to new commercial opportunities and is available to SMEs"*. According to Filatotchev et al. (2009), performance of SMEs is positively correlated with amount of quality R&D transfer. Rephrasing it in other words, countries with better research and development explore new niches faster and in more efficient way, which, in turn, allows entrepreneurs to create new businesses in these niches and capture a certain market share. It is a good variable to include in the model, because it is logical to assume that national R&D transfer will produce opportunities for innovative entrepreneurs to enter the market that has not been previously entered before, which is the exact definition of innovative entrepreneurship. Thus, the hypothesis 9 is *"Countries that have higher R&D transfer rates, score higher on innovative entrepreneurship rate"*.

To sum up, several variables that might influence innovative entrepreneurship from economic perspective were formulated and the justification for including them in the model. This gives a good basis for building models comparing cultural effects and economic effects on innovative entrepreneurship.

Data and Methodology

Data for this thesis is collected through different sources and is publicly available. Part of the data was taken from GEM, Global Entrepreneurship Monitor. Beyond that, data set on Hofstede's IDV axis (Minkov et al., 2017) is used. Data from 50 countries was collected after choosing the countries that are present both in GEM and Minkov's paper. Research design itself is a cross-sectional country-based data, that, as mentioned previously, incorporates 50 countries.

Global Entrepreneurship Monitor collects the data in two ways, through Adult Population Survey (APS) and National Expert Survey (NES). APS provides information on entrepreneurial activities within the countries, whereas NES provides information on national conditions of entrepreneurship (mostly economic or political), with survey conducted through a limited amount of experts, contrary to the wider array of people surveyed through APS.

Credibility of the sources

There are two datasets used in this thesis – GEM and Minkov's et al. (2017) paper that uses Hofstede's framework. GEM, or a Global Entrepreneurship Monitor, is the largest dataset that has the goal to systematically find out the drivers and consequences of entrepreneurship. Global Entrepreneurship Monitor uses surveys and telephone interviews to get the data needed.

GEM was started as an effort to fill the void of entrepreneurship statistics that caused severe problems for academic research on entrepreneurship and related activities. GEM is proven to be a reliable dataset for conducting scientific research (Bergmann et al., 2014). It has different drawbacks. For example, the fact that GEM collects all types of entrepreneurship and entrepreneurial activity, which include both formal and informal activities, part-time and full-time activities, and self-employment, is considered a drawback by some (The Economist, 2011). However, the dataset is still reliable and is arguably the best one for entrepreneurship activity.

The second dataset is taken from the Minkov et al. (2017) paper. This dataset is proven reliable too for different reasons: first of all, this is the peer-reviewed academic work, so it get a certain degree of trust. Secondly, the framework that the paper used is academically acknowledged framework that was introduced by acclaimed social psychologist Geert Hofstede, which makes the framework trusted and valid as well. This way it can be claimed with a degree of certainty that both of the sources are valid and it is safe to take data from them.

Cultural differences variables

All cultural difference variables can be found in the Table 1 in the Appendix A. The dependent variable in this thesis is *innovation.* According to GEM, innovation variable is "a percentage of those involved in entrepreneurial activities who indicate that their product or service is new to at least some customers AND that few/no businesses offer the same product".

Fear of Failure variable is one of the explanatory variables that indicates a percentage of population aged 18-64 that indicate that fear of failure is preventing them from setting up a good business, even though they perceive potential opportunities. Another explanatory variable that was used from GEM dataset is *High Status to Successful Entrepreneurs.* This variable shows the percentage of 18-64 population that indicates that successful entrepreneurs receive high societal status in their country.

The explanatory variable that was taken out of Minkov et al. (2017) paper is *IDV.* Originally in the research paper, authors performed the analysis of 56 countries on Individualism-Collectivism axis, using the framework created by Geer Hofstede. The scores in the paper were ranging from 182 to -291, so for the sake of completeness, the scores were transformed to range from 0 to 100 by using the formula *transformed IDV = score/highest score * 100.* These scores can be seen in the table 1, Appendix A.

Economic variables

Beyond cultural differences variables, I took variables that describe economic and entrepreneurial climate from GEM. All these variables were in range from 1 to 5 with two decimals, where 1 was Not sufficient and 5 was High sufficient. For the sake of completeness, all these variables were transformed by using the formula *transformed value = value * 20.* These scores can be seen in the table 2 in the Appendix A.

Variable *Financing for Entrepreneurs* describes the availability of financial resources for SMEs in a given country. *Governmental Support and Policies* shows the extent to which government of a given country supports entrepreneurship. *Taxes and Bureaucracy* shows the extent to which bureaucratic and taxations measures are welcoming to new and existing entrepreneurs. *Post School Entrepreneurial Education and Training* shows the extent to which training in creating or managing SMEs is included in the higher education system. *R&D Transfer* variable shows the extent to which national research and development leads to new commercial opportunities for CMEs. *Commercial and Professional Infrastructure* variable shows the presence of legal, commercial and accounting services and institutions that support SMEs.

Non-inclusion of GDP in the model

GDP is one of the main and most common variables that are used in economic research. However, it was not included in the paper as the independent variable. There is a reason for this, so I will have to address it in this section of the thesis.

The reason for non-inclusion of the GDP is the presumed fact that GDP and entrepreneurship entry relationship is U-shaped (Wennekers et al., 2005). Because the relationship between GDP and entrepreneurial entry is not linear, it is possible that it will blur the results when building a linear regression model, which is the method that I am going to use in this work. Inclusion of GDP may be an interesting idea for future research, but this paper does not include that variable.

Methodology

In this paper the linear regression method is used as the basis of model building. The formula for that model is the following:

$$Y = a + bX + \epsilon$$

In that formula Y is our dependent variable, a is the constant, X is an independent variable, and b is a coefficient. ϵ is the standard error.

Before building the regressions, the correlations between different variables used in regressions were assessed to preliminarily evaluate the possible effect.

Several models are built to fully answer the research question. The first model takes *innovation* variable as the dependent variable and takes different *cultural differences* variables as independent ones. The goal of this model is to evaluate whether there is a significant effect of *cultural differences* on *innovation*. The variables that are included as independent variables in the first model are the following: *high status, fear of failure* and *individualism*.

Thus, the first model has the following form:

$$(I) Innovation$$
$$= \beta_0 + \beta_1 * (HighStatus) + \beta_2 * (Fear of Failure) + \beta_3$$
$$* (Individualism)$$

The second model again takes *innovation* as its independent variable but takes only economic variables as independent ones. The goal of this model is to evaluate whether economic variables have a significant effect on *innovation*. The variables that are included as independent variables are the following: *financing for entrepreneurs, government policies, taxes and bureaucracy, post school entrepreneurship education, R&D transfer, commercial and professional infrastructure*.

Thus, the second model has the following form:

$(II)Innovation$
$$= \beta_0 + \beta_1 * (Financing) + \beta_2 * (GovtPolicies) + \beta_3 * (Taxes) + \beta_4$$
$$* (EntreEducation) + \beta_5 * (RDtransfer) + \beta_6 * (Infrastructure)$$

The third model combines first and second models and includes both *economic* and *cultural* variables. The goal of this model is to evaluate in a single regression whether cultural difference variables have a statistically significant effect on the independent *innovation* variable in the presence of economic variables.

Thus, the third model has the following form:

$(III)Innovation$
$$= \beta_1 * (HighStatus) + \beta_2 * (FearofFailure) + \beta_3 * (Individualism)$$
$$+ \beta_4 * (Financing) + \beta_5 * (GovtPolicies) + \beta_6 * (Taxes) + \beta_7$$
$$* (EntreEducation) + \beta_8 * (RDtransfer) + \beta_9 * (Infrastructure)$$

Results

Visual evaluation of the variables

Before evaluating the results, the heatmap of innovative entrepreneurship is presented, since it allows us to evaluate the data visually. On figure 1 one can see the rates of innovative entrepreneurship, or a percentage of businesses in countries that say that they are creating a new product for the market. Countries with a darker shade of red have higher rates, whereas

countries with brighter shade of yellow have lower rates. Countries coloured black provided no data.
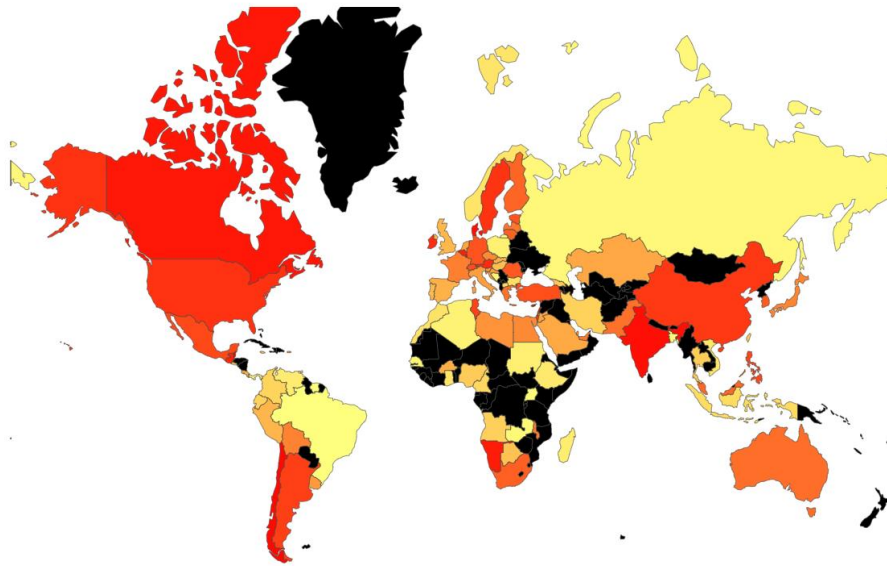
Figure 1 – the rates of innovative entrepreneurship. Data taken from Global Entrepreneurship Monitor (2017)

Descriptive statistics

Before building the models, descriptive statistics of the dataset will be analysed. All descriptive statistics can be found in Table 3.

Table 3

Descriptive statistics

Variables	Mean	Median	Standard Deviation
Innovation	27.11	32.05	9.19
Fear of Failure	37.50	37.30	8.77
High Status	69.76	71.00	10.05
Individualism	61.29	60.47	19.71
Financing for entrepreneurs	55.68	56.80	9.27
Government support and policies	55.11	54.80	11.99
Taxes and bureaucracy	49.43	49.00	11.88
Post school entrepreneurial education	58.76	59.20	7.84
R&D transfers	50.29	50.40	7.93
Commercial and professional infrastructure	61.36	61.60	7.29

Standard deviation provides information on which variable is the most volatile across all countries. As it can be seen, *Individualism* changes the most across all countries by a large margin, as it has the highest standard deviation of 19.71, followed by *Government Support and Policies*, which has 11.99. The variable that changes the least across all countries is *Commercial and Professional Infrastructure* which has a standard deviation of 7.29.

Correlation analysis

Before moving to the mathematical models, correlation analysis is performed for cultural differences variables to evaluate the direction and magnitude of their relationship with dependent variable Innovation and between the independent variables themselves. The results can be found in the table 4 found in Appendix A, which shows the correlations between every cultural difference variable and innovation.

There is also a weak negative correlation between innovation and high status to successful entrepreneurs, which is against my expectations. I expected societies with high status to successful entrepreneurship to have higher rates of entrepreneurship and, consequentially, higher innovation rates, but, turns out, this is not the case.

However, the correlation ratio of 0.31 between individualism and innovation is totally in line with the expectations, because, as was mentioned before, high individualism is academically acclaimed to be one of the main drivers of entrepreneurship.

There is also a weak positive correlation of 0.11 between innovation and fear of failure, which is against the expectations, as I would expect societies with low fear of failure to be more experimental and risk-loving, thus having higher innovation rates. The correlation analysis proves this theory otherwise.

For better examination of the relationship of the variables, scatterplots and regression lines were built for all the dependent cultural variables and independent variable. These scatterplots can be found in Appendix C (figures 10-12).

Regression analysis – model 1

The first model is, as mentioned before, the simple model that includes only cultural differences variables. Table 5 shows the results of the first regression. As we can see, the R-squared of the model is 0.1095, which means that the model explains only 10% of the variance, which allows us to see that this model has pretty low explanatory power. Out of

three independent variables, only one variable, *individualism*, is statistically significant at p < 0.05. This goes in line with the expectations, since it was stated several times that individualism is commonly said to be the main driver of entrepreneurship. The coefficient of *individualism* shows us that the raise in one point of *individualism* raises the *innovation* score by 0.029, which is comparatively low. This means that individualism does not have strong power over innovative entrepreneurship, according to the model, even though it is statistically significant, having p-value of 0.049.

Table 5

Results of the first regression model

N=50, dependent variable - *Innovation*	R-squared = 0.1095	Adjusted R-squared = 0.05?
Independent variables	**Coefficient**	**P-value**
Fear of Failure	0.037	0.812
High Status	-0.095	0.465
Individualism	0.029	**0.049**
Constant	32.406	**0.003**

Regression analysis – model 2

Table 6 shows us the results of the second regression, where only the economic variables were included. None of the variables are statistically significant at p < 0.05 and only one variable is significant at p < 0.1, which is *government support* (p = 0.084). According to the model, none of the economic variables, except for government support to entrepreneurs, significantly affect the innovative entrepreneurship rates, which was not expected initially. A lot of results from this model are very counterintuitive – for example, *Financing for Entrepreneurs* has a negative coefficient, which implies that easier financing for entrepreneurs leads to less innovative entrepreneurship in countries. The only variable that followed the expectations, was *Governmental Support,* which is significant and produces an expected positive effect.

Table 6

Results of the second regression model

N=50, dependent variable - *Innovation*	R-squared = 0.1924	Adjusted R-squared = 0.0771
Independent variables	**Coefficient**	**P-value**
Financing for Entrepreneurs	-0.178	0.366
Governmental Support	0.272	**0.084**
Taxes and Bureaucracy	-0.082	0.564
Entrepreneurial Education	-0.049	0.804
R&D Transfer	0.191	0.529
Infrastructure	0.261	0.256
Constant	3.341	0.792

Regression analysis – model 3

Table 7 shows the results of the final, expanded model, where all of the variables were included. In this model none of the variables are significant at $p < 0.05$, and the only variable significant at $p < 0.1$ is government support. However, the explanatory power of this model is the strongest, as this model explains the most variance of dependent variable out of all three models (R-squared of 0.2362 against R-squared of 0.1924 in the second model and 0.1 in the first model). Therefore we can conclude that this model is probably the best one at

evaluating the effects of variables on innovative entrepreneurship, even though the results about variables are very inconclusive.

Table 7

Results of a third regression model

N=50, dependent variable - *Innovation*	R-squared = 0.2362	Adjusted R-squared = 0.06
Independent variables	**Coefficient**	**P-value**
Fear of Failure	0.053	0.762
High Status	-0.008	-0.306
Individualism	0.024	0.166
Financing for Entrepreneurs	-0.126	0.569
Governmental Support	0.311	**0.062**
Taxes and Bureaucracy	-0.09	0.544
Entrepreneurial Education	0.07	0.751
R&D Transfer	-0.015	0.964
Infrastructure	0.133	0.598
Constant	8.521	0.610

Discussion

All in all, it can be said that the results derived from the mathematical models are controversial. First of all, only one variable is statistically significant at the level of $p<0.1$ – *government support*. Beyond that, *individualism* is statistically significant on a simple version

of model, but fails to be significant on an expanded one, which is against the expectations. Individualism was expected to have the strongest effect, but according to the model this is not the case.

Secondly, it is certainly surprising that variable *fear of failure* shows low correlation to innovative entrepreneurship, since low uncertainty avoidance, as previously mentioned, was another big driver for entrepreneurial entry. We can assume that there are much larger differences between drivers of entrepreneurial entry and drivers of innovative entrepreneurial entry than previously assumed and maybe innovative entry is influenced by different factors and variables.

Hypothesis 1 – Individualism and innovation

Individualism has a significant effect in the first model at $p<0.05$, although the coefficient is very low. In the expanded model individualism does not have a significant effect on the innovation rates at all. This was unexpected, as individualism had a highest correlation with innovation out of all variables ($r=0.31$). This was also unexpected, as according to the previous research mentioned in Theoretical framework section, individualism is one of the main drivers of innovation. However, according to the models, individualism is not a driver for innovative entrepreneurship. It could be explained by the fact that in modern world both collective and individualistic cultures have a need for innovation, so innovative entrepreneurs fill that niche. This is an assumption, as the exact reasons why individualism does not affect innovation rates are unknown.

Hypothesis 2 – Fear of failure and innovation

The first hypothesis was the following: "*countries scoring high on "Fear of Failure" rate score low on innovative entrepreneurship rate*". As it was mentioned before, the models did reject the hypothesis. Correlation coefficient was even showing the opposite – countries

scoring higher on fear of failure rate also scored higher on innovation scale. Regression models had shown that fear of failure wasn't a statistically significant variable, thus having no real effect on innovation. This could possibly be explained by the following - fear of failure affects only entrepreneurial entry, but as individual crossed that line and started his own business, fear of failure no longer has an effect whether that business is innovative or not.

Hypothesis 3 – High status and innovation

The third hypothesis stated: *"cultures that give high status to successful entrepreneurs score higher on innovation scale"*. As with previous two cultural variables, this one was also shown to be statistically insignificant in expanded model, and, akin to fear of failure, was insignificant in the simple version of the model too. The explanation for this is also similar to the explanation given above for the variables – maybe the drivers that affect entrepreneurial entry and innovative business entry are different and the decision on whether one should start an innovative or not innovative business relies on a set of different variables rather than ones presented in this paper.

Hypotheses 4-9 – Economic variables

The fourth to ninth hypotheses were related to different economic variables. None of the hypotheses above, except for the *government support* one, were proven to be right. Even then, since in the expanded model it was significant only at $p<0.1$, we do not have enough evidence to say with utter certainty that government support positively influences innovative entrepreneurship. However, we can say that there is a distinct possibility that innovative entrepreneurship thrives when government supports entrepreneurs, so they feels safer trying out new, risky ideas. This echoes the idea in Leitao and Baptista (2009), where it was stated that governmental support is an important driver of entrepreneurial activity in general, and, by extension proven in our mode, innovative entrepreneurial activity as well. At the same time, we can say that, according to our model, none of the economic variables, except for

Government Support, have a significant effect on innovative entrepreneurship. Again, this could be explained by the fact that there are some other, hidden drivers that influence whether an individual would start an innovative business rather than a non-innovative one. As the factors influence entrepreneurship in general, they do not help to provide a distinction between normal and innovative entrepreneurship.

Research question

After summarizing all of the hypotheses, the research question can finally be answered. The research question was *"What cultural and economic variables influence innovative entrepreneurial entry?"*. After evaluating the hypotheses, it can be said that cultural variables studied in the paper do not influence the innovative entrepreneurial entry, and only governmental support out of all studied economic variables can influence the rates of innovative entrepreneurship. Although the results from the models are generally insignificant, it highlights one important problem with research of innovative entrepreneurship – common drivers that are described in literature and that influence entrepreneurial entry are not suitable for explanation of innovative entrepreneurial entry and one needs to look for other drivers to explain what exactly leads to increased or decreased innovative entrepreneurship rates. Another problem is that variables, while influencing the entrepreneurial entry, do not distinguish between innovative and non-innovative entrepreneurship. Therefore it should be noted that insignificance of the results means only that according to the models, the variables do not lead to higher/lower percentage of innovative entrepreneurship in respective countries, and the effect on all entrepreneurial activity might be significant.

Although this paper fails to explain the phenomena, it highlights the problem of the lack of research on this topic. This will be more explicitly covered with other limitations of the paper in the next section.

Added value

This work has some new points that were never touched upon in the preceding studies. Previous academic paper focused mostly rather on entrepreneurial entry and its drivers or on motives and drivers of innovation, leaving the reasons behind innovative entrepreneurial entry in the shadows. This work tried to mend the gap and cover the reasons why do entrepreneurs choose to go the innovative route and whether the cultural variables can be an answer to that or if there are different factors in play.

Beyond that, this research increases the awareness about the lack of fundamental research on innovative entrepreneurship and highlights the issue that innovative entrepreneurship is much more than just an extension of entrepreneurship, but rather a completely different branch that needs to be studies and researched much more than it is now.

Lastly, this paper serves as a bridge between entrepreneurial entry research and innovation research, combining the concepts and notions from both of these fields and applying them to the real datasets to answer the questions regarding innovative entrepreneurship.

Limitations and suggestions

Obviously, this paper has limitations. First of all, the models that are used in the paper might suffer from the omitted variable bias, as there might be variables that potentially have a high effect on innovative entrepreneurship in a country that were left out from the analyses. This also might have influenced the coefficients of existing variables, as the coefficients would not show the true effect on independent variable in the presence of omitted variable bias. The control variables that might influence the amount of innovative entrepreneurship in country might be other cultural variables, form of government, economic freedom, and many others. More careful and thorough research should be conducted in order to identify other,

less obvious and/or logical variables that have an effect on the amount of innovative entrepreneurship.

Beyond that, data is also limited in this thesis. Firstly, there are only 50 countries present in the paper. This is due to a fact that both GEM and Markov et al. datasets are limited, since they do not include all the countries in the world, and the data is limited to the amount of countries that overlap in both datasets. The data itself also is a significant limitation, as GEM dataset is essentially a survey performed with voluntary participants. As with other surveys, there are several dangers present: lack of objectivity, as different people can interpret a question differently and provide an unreliable answer, lack of strict criteria, prevalence of anecdotal evidence (for example, a person that had a bad experience with bureaucratic system might critique it too harsh), and so on. This research could be significantly upgraded by including a more objective dataset that could evaluate the amount of innovative entrepreneurship, fear of failure and others on a less subjective basis.

Another limitation was the fact that the models were only cross-sectional and did not include time-series to evaluate the change in trend of innovative entrepreneurship. Including time-series models could shed some light on what factors influence innovative entrepreneurship and what are the current trends regarding it. Also, GDP not being included in the models is another limitation, but, as explained by the section "Non-inclusion of GDP", there were reasons for that. However, more in-depth research may want to incorporate GDP in modelling.

The recommendations for future research regarding the topic of innovative entrepreneurship would be the following: first of all, identifying more and better drivers for innovative entrepreneurship would be very helpful, as, turns out, common drivers for entrepreneurial entry are not suitable to distinguish between the innovative entrepreneurship and non-innovative one. A deeper dive in motives of innovative entrepreneurs is needed, so it is possible that to find a reliable answer to the research question one would need to perform a cross-discipline study that would include elements of psychology, sociology and economics.

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Appendix A: Tables

Table 1

Cultural differences variables, by country

Country	Fear of failure rate	Innovation	High Status to Successful Entrepreneurs	IDV norm
Argentina	31.92	32.17	49.96	60.47
Australia	41.37	28.51	68.91	79.07
Austria	36.73	37.02	75.3	81.61
Belgium	48.48	39.72	54.51	84.78
Brazil	32.61	3.71	80.8	49.68
Canada	42.32	41.3	74.09	78.01
Chile	28.58	47.58	60.82	59.83
China	41.7	33.06	68.72	54.97
Colombia	23.1	16.07	84.18	44.40
Czech Republic	35.75	27.51	47.78	76.32
Denmark	40.99	46.34	80.47	91.12
Egypt	28.24	27.52	82.57	31.71
Finland	37.55	29.4	83	80.13
France	37.08	28.07	71.52	79.70
Germany	35.06	30.53	74.79	83.09
Greece	57.76	28.44	67.8	67.86
Hong Kong	37.3	27	63.4	60.47
Hungary	43.17	20.4	71	76.74
India	50.06	46.88	65.03	40.17
Indonesia	34.12	15.36	74.85	25.37
Ireland	39.32	35.75	83.86	67.23
Israel	47.47	32.9	84.98	64.90

Italy	51.67	24.27	74.63	62.58
Japan	46.41	27.74	51.46	70.40
Kazakhstan	18.37	23.54	80.11	39.11
Malaysia	44.95	29.33	69.88	42.71
Mexico	28.4	31.71	52.34	48.20
Netherlands	34.74	23.83	63.05	100.00
Nigeria	16.33	18.3	61.89	0.00
Norway	37.56	18.58	83.47	85.20
Peru	30.15	21.9	62.35	36.79
Philippines	36.45	31.84	76.15	34.88
Poland	31.06	12.17	76.33	58.35
Portugal	38.12	21	63.4	67.86
Puerto Rico	20.74	26.06	52.63	55.39
Romania	40.49	30	75.07	57.51
Russia	46.42	8.09	68.04	57.08
Singapore	39.4	20.47	62.91	55.39
South Africa	31.31	29.66	74.86	39.32
South Korea	32.82	29.94	69.95	66.81
Spain	36.19	22.33	49.75	73.78
Sweden	37.24	33.71	72.13	89.64
Switzerland	39.85	31.68	69.71	83.72
Taiwan	41.41	18.76	63.13	52.43
Thailand	58.92	17.8	80.87	35.94
Turkey	28.1	30.8	66.09	57.72
United Kingdom	37.66	21.63	76.42	81.18
United States	35.21	33.99	78.69	68.50
Vietnam	46.63	13.86	74.77	45.03

Table 2

Economic variables, by country

	Financing for entrepreneurs	**Governmental support and policies**	**Taxes and bureaucracy**	**Post school entrepreneurial education and training**	**R&D transfer**	**Commercial and professional infrastructure**
Argentina	38.6	75.8	44.8	61.8	54	61
Australia	52.6	46.4	49	45.8	43.4	60.2
Austria	60.2	56	48.2	63.2	54.2	73.2
Belgium	63.4	79.2	39	64.8	54.8	75.2
Brazil	58.4	35.6	29	49.2	42.4	53.8
Canada	62.6	59	52.2	57	57.2	72.8
Chile	47	62.8	57	60.6	45	49.4
China	55	58	55.2	62.8	48.6	50.2
Colombia	39.4	46.2	45.2	68.4	41.2	51.8
Czech Republic	49.4	40.8	40.4	48	44.8	62
Denmark	54.6	66.6	66.2	68.6	55.4	71.2
Egypt	52.2	52.4	43.2	44.4	42.4	53.8
Finland	62.6	65.2	63.6	60	55.4	67
France	56.8	71.8	64	67.6	57.4	63.6
Germany	56.8	52	52.6	54.6	55.4	67.8
Greece	48.8	40.4	33	47	47.6	54
Hong Kong	58.4	64.8	83.6	56.2	49	62.8
Hungary	54	37.2	35.6	51.8	45.6	58.6
India	67.8	75.8	56.8	62.6	63	69
Indonesia	71.2	75.8	66	77	66	69
Ireland	63.2	59.6	54	60.8	55.2	62.4
Israel	63	44.6	33	55.8	53	68.8
Italy	56	48.4	38.6	53.6	48	51.6
Japan	59.6	64.6	50.8	51.6	60	52.6
Kazakhstan	42.4	66.2	55.2	49.6	38.6	57.4

Malaysia	69.6	54.8	50	54.8	48.4	59.6
Mexico	48.2	54.8	46	69.6	50.8	53.8
Netherlands	70.8	66	65.2	74.4	63	72.6
Nigeria	41	39.4	36.6	55.8	34.6	51.8
Norway	50.6	45.4	52	50.4	51	65.4
Peru	43.6	42	40.6	59.8	41.8	49.6
Philippines	61.8	47.8	37.2	76.6	49	62
Poland	64	59.8	38.6	49	45.4	59.2
Portugal	59	57	35.4	62	55.2	65.4
Puerto Rico	38.2	36	31.2	60.2	39.4	52.6
Romania	39.4	41.8	41.2	54.6	43.2	72.8
Russia	41	44.6	41.2	58	33.8	60.4
Singapore	71.2	69.6	79.6	66.8	63.4	64.6
South Africa	50.2	49	41.4	50.6	34.8	54
South Korea	56	73.8	53.6	52.4	48.6	51.8
Spain	53.6	57	49.4	65	55.2	62.6
Sweden	57.2	48.6	44.4	55.8	50.4	59.8
Switzerland	55.8	57.2	57.6	64.2	65.2	68.6
Taiwan	65.4	72	66.8	66	61.6	68.6
Thailand	64.2	55.2	50.4	59.2	49.6	58.2
Turkey	57	53.8	43	61	54.2	65.6
United Kingdom	59.6	41.2	59.6	52.2	51	61.6
United States	71.4	50.6	56.8	65.8	53	70.6
Vietnam	45.4	38	48	52.2	43.8	56.4

Table 4

Variable correlation table

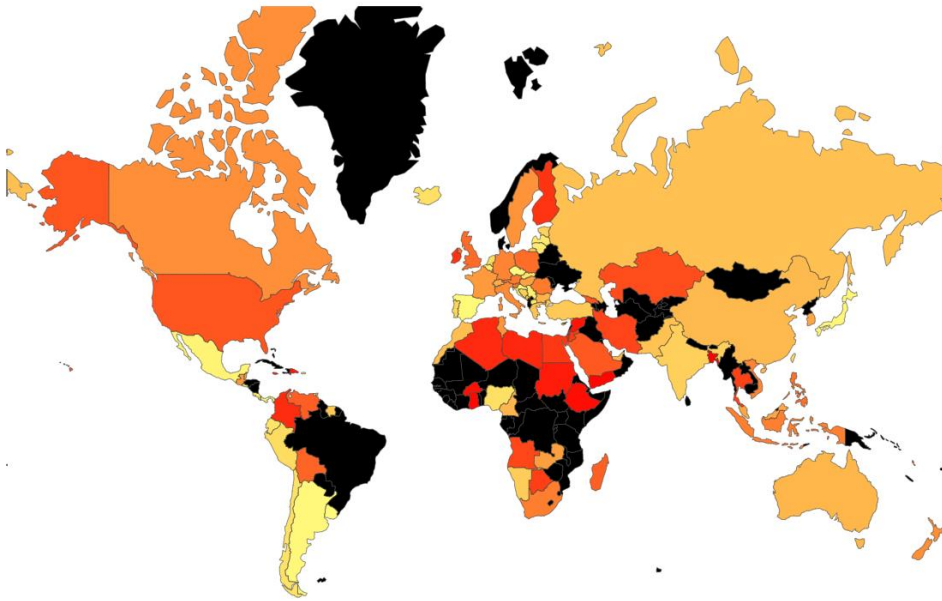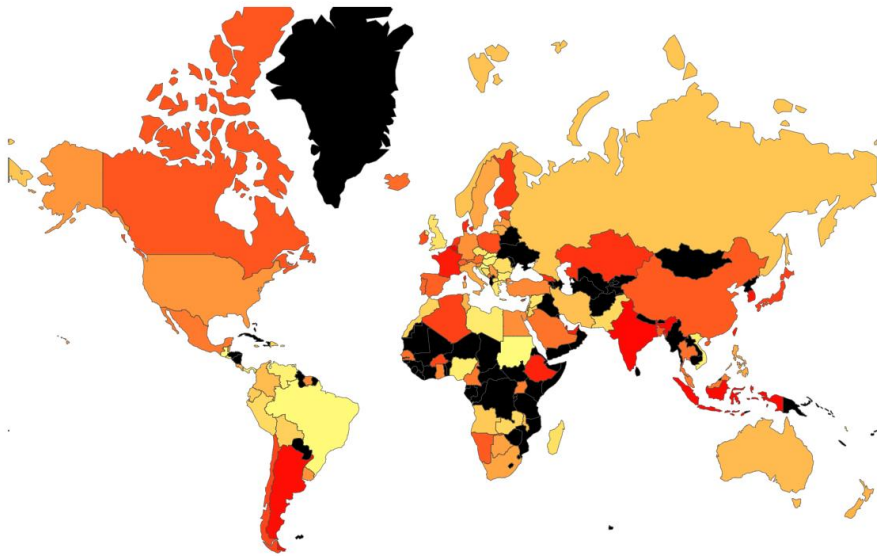|	Innovation	Fear of Failure	High Status	Individualism
Innovation		*0.11431*	*-0.11289*	*0.31341*
Fear of Failure	*0.11431*		*0.08788*	*0.29482*
High Status	*-0.11289*	*0.08788*		*-0.03891*
Individualism	*0.31342*	*0.29482*	*-0.03891*	

Appendix B: Heatmaps
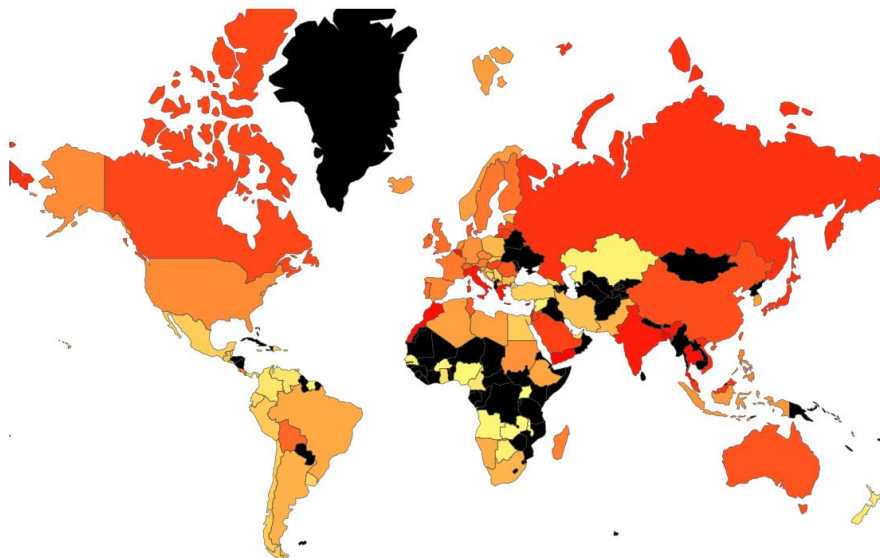
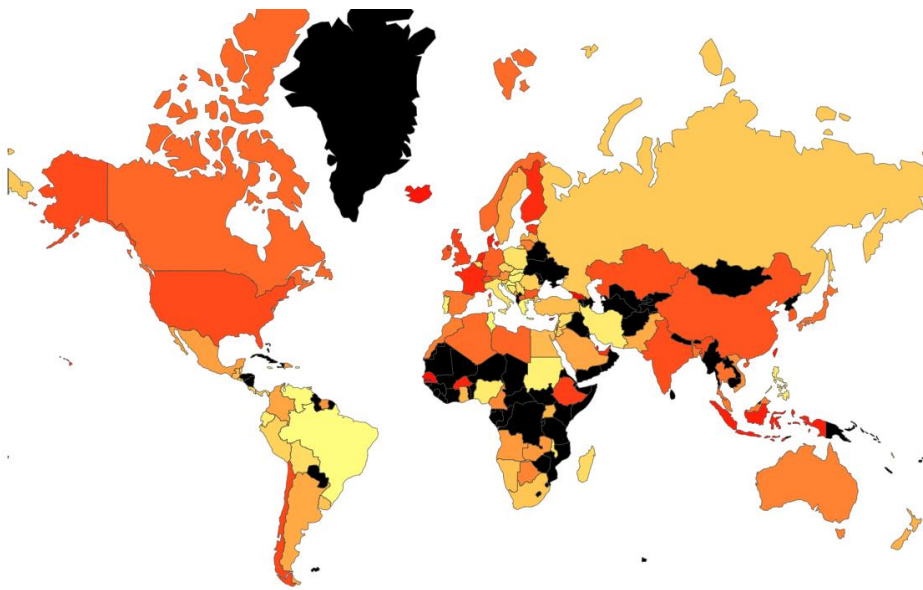*Figure 2: Fear of Failure*

Figure 3: High Status to Successful Entrepreneurs
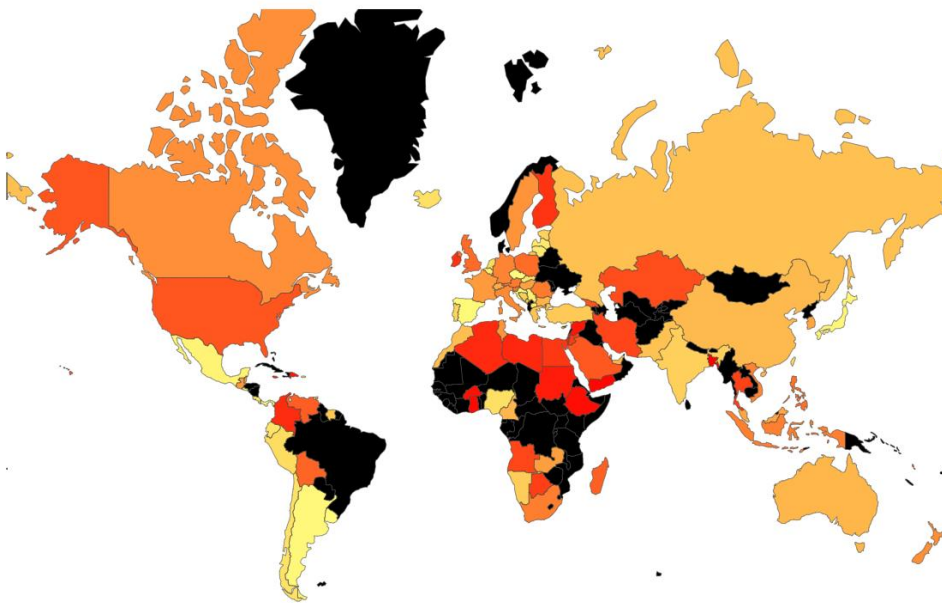
Figure 4: Financing for Entrepreneurs

Figure 5: Governmental Support and Policies

Figure 6: Taxes and Bureaucracy
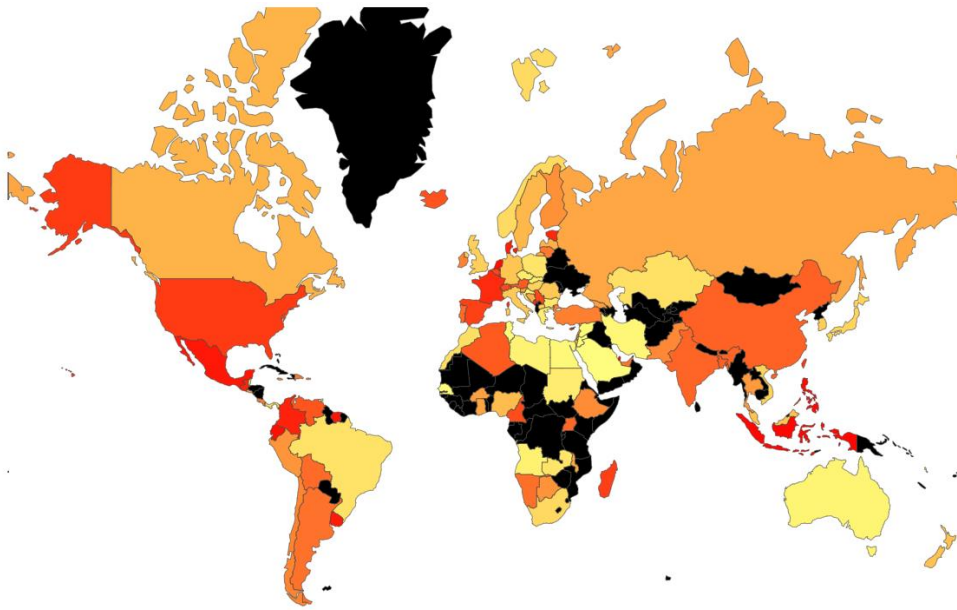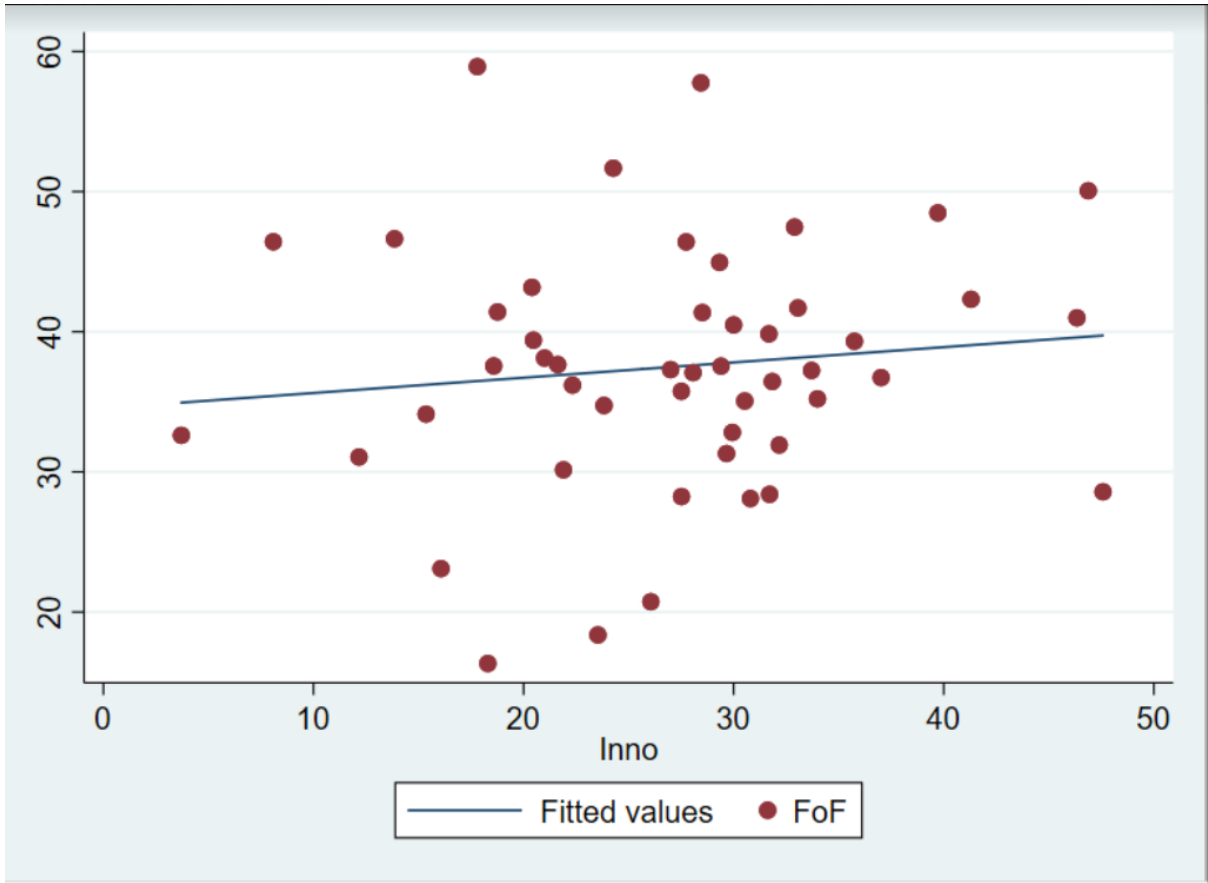
Figure 7: Post School Entrepreneurship Education
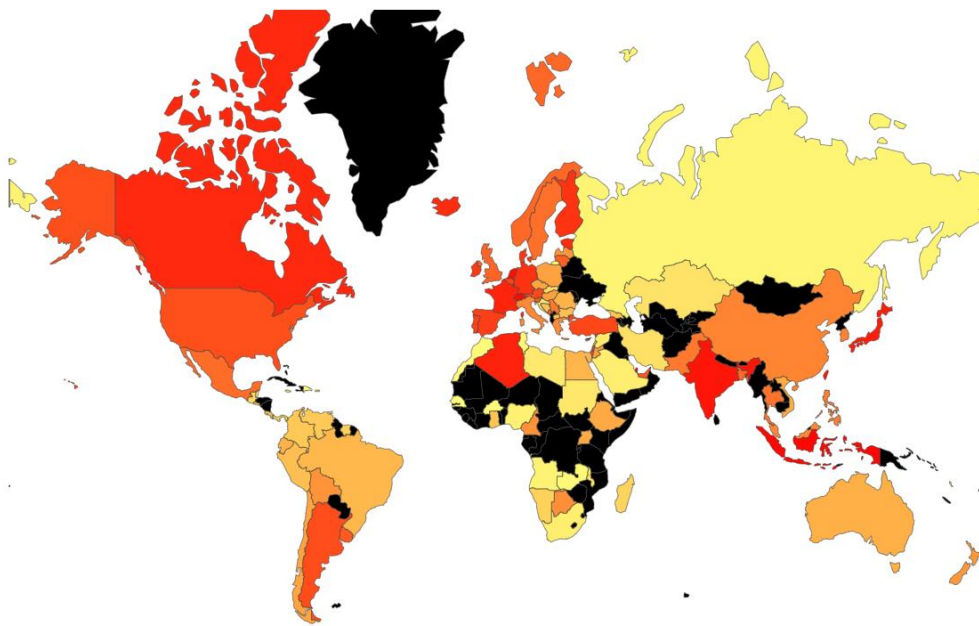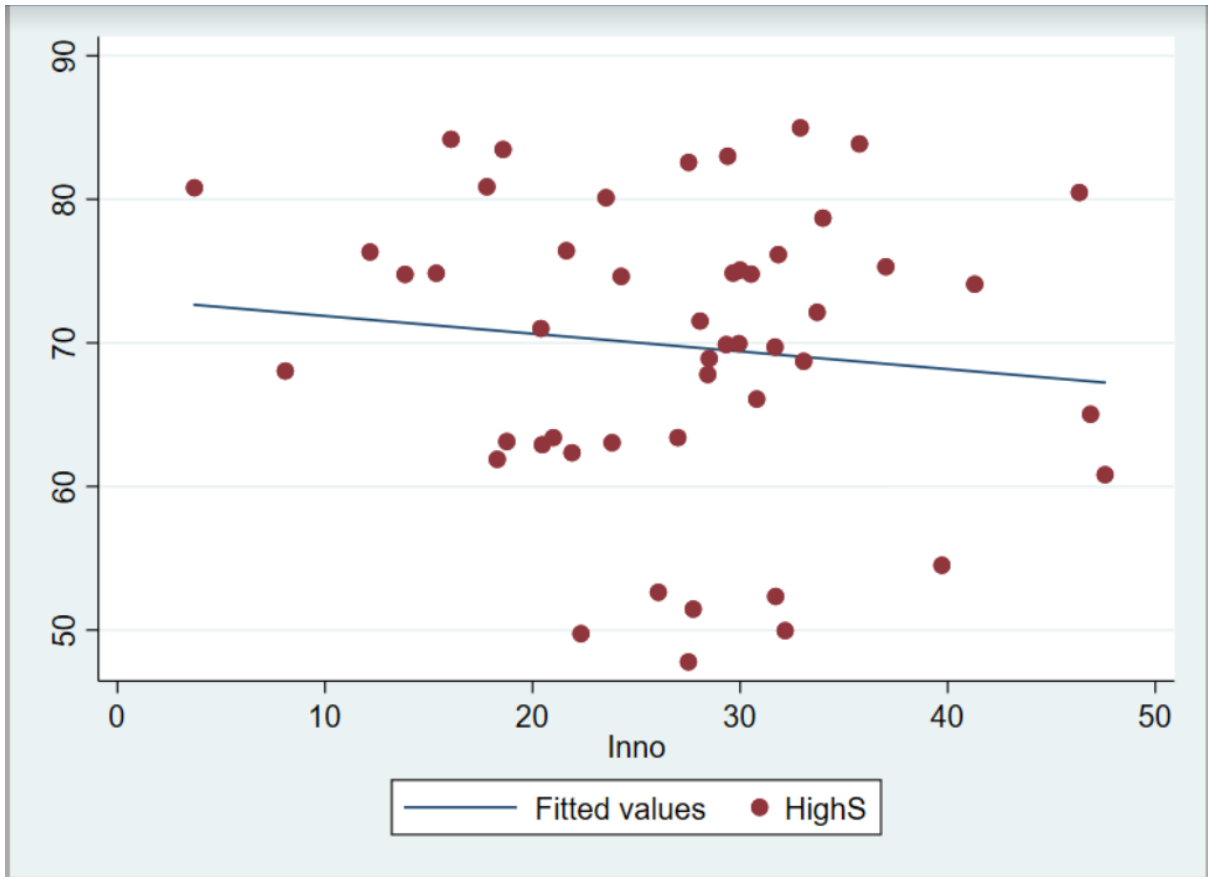

Figure 8: R&D Transfer
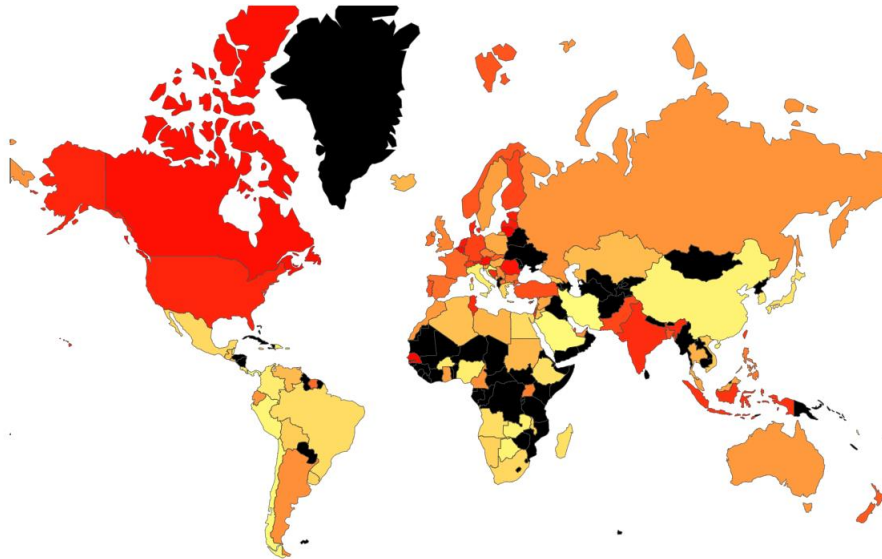
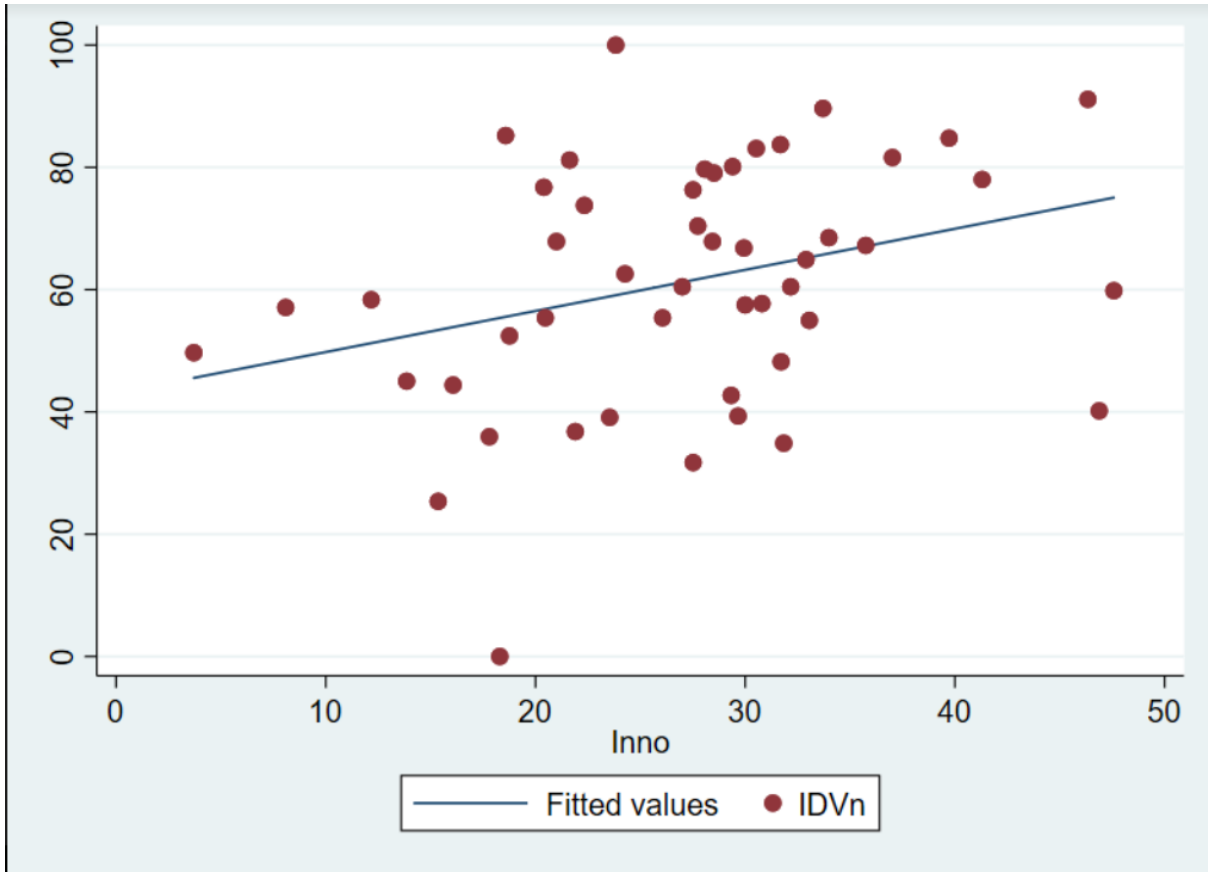*Figure 9: Commercial and Professional Infrastructure*

Appendix C: Scatterplots

Figure 10: Relationship between innovation and fear of failure

Figure 11: relationship between high status to successful entrepreneurs and innovation

Figure 12: relationship between individualism and innovation